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11
12 UNITED STATES DISTRICT COURT
13
14 NORTHERN DISTRICT OF CALIFORNIA
15
16 SAN FRANCISCO DIVISION
17

18 UNITED STATES OF AMERICA,

19 Plaintiff,

20 v.

21 ELIJAH COOPER,

22 Defendant.

Case No. 13 Cr. 693 SI

DECLARATION OF ETHAN A. BALOGH
FILED APRIL 27, 2015

Before the Honorable Susan Illston
United States District Judge

1 I, Ethan A. Balogh, declare under penalty of perjury as follows:

2 1. I am a partner in the law firm of Coleman, Balogh & Scott LLP and serve as counsel
3 to Elijah Cooper. I am admitted to practice before this Court, and except as where otherwise
4 expressly noted, I state the following on personal knowledge, and if called as a witness could
5 testify competently thereto.

6 2. On April 23, 2015, I submitted through the Criminal Justice Act staff a request for the
7 production of the transcript of the April 21, 2015 Pretrial Conference. That request has been
8 approved and I await production of that transcript.

9 3. Attached hereto as Exhibit A is a true and correct copy of the revised expert disclosure
10 for Hector Luna which the Government filed on April 24, 2015 as ECF No. 166. I have
11 highlighted the document to reflect points raised in the Objections filed contemporaneously with
12 this declaration.

13 4. Attached hereto as Exhibit B is a map my associate created using the GPS tower
14 information from the Government's revised Expert Notice (ECF No. 166) and reflecting the
15 tower locations and the center lines presented in the Government's notice, using a protractor.

16 5. Attached hereto as an Exhibit C is a map my associate created using the GPS tower
17 information from the Government's revised Expert Notice (ECF No. 166) and reflecting the
18 tower locations and the angles of coverage presented in the Government's notice, using a
19 protractor.

20 6. Following the Pretrial Conference, I consulted with expert witness Jim Norris, who I
21 am informed and believe has been approved by this Court as an expert witness regarding Cell
22 Site Location Data. Mr. Norris informed me that the Notice provided as Exhibit A to this
23 declaration is insufficient to determine where the mobile telephone ascribed to Mr. Cooper was
24 located at the time of the controlled buy, other than to say it appears the telephone was located in
25 the Bayview/Hunter's Point area of San Francisco. Mr. Norris further informed me that without
26 a "propagation" map of each tower's coverage, no further details could be determined. Mr.
27 Norris further informed me that to accurately estimate the potential reach of these cell phone
28 towers, an expert would need to go into the field to take measurements of particular locations to

1 determine if those locations were in reach of a particular tower. Mr. Norris further informed me
2 that accepting the statements in the Revised Notice regarding Tower 438, the changes in the
3 beam width of sector 2 of that tower on an unknown date between October 24, 2012 and March
4 5, 2013 means that no expert could accurately assess the reach of that tower on February 5, 2013
5 by field work subsequent to March 5, 2013.

6 7. Attached hereto as an Exhibit D is a map my associate created using the GPS tower
7 information from the Government's revised Expert Notice (ECF No. 166) and reflecting the
8 tower locations and the angles of coverage presented in the Government's notice, using a
9 protractor. Also reflected on Exhibit 69 is Mr. Cooper's residence, 69 Kiska Road.

10 8. Attached hereto as Exhibit E is a true and correct copy of what I am informed and
11 believe is an Opinion and Order issued by the Honorable Joan H. Lefkow in *United States v.*
12 *Antonio Evans*.

13 I state the foregoing is true and correct under penalty of perjury under the laws of the
14 United States.

15
16 Dated: April 27, 2015

/s/ E A Balogh
ETHAN A. BALOGH

EXHIBIT A

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

UNITED STATES OF AMERICA,)	Case No. 13-CR-0693 SI
)	
Plaintiff,)	UNITED STATES' SUPPLEMENTAL RULE
)	16(a)(1)(G) NOTICE FOR CELL SITE EXPERT
v.)	
)	
ELIJAH COOPER,)	
)	
Defendant.)	
_____)	

The government makes this filing in response to the Court's April 23, 2015, Final Pretrial Scheduling Order, in which the Court ordered the government to supplement its Rule 16(a)(1)(G) notice for its cell site expert Special Agent Hector Luna. The supplemental notice is attached as Exhibit A.

DATED: April 24, 2015

Respectfully submitted,

MELINDA HAAG
United States Attorney

/s/
Marc Price Wolf
Brigid Martin
Assistant United States Attorneys

Exhibit A



*United States Attorney
Northern District of California*

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April 24, 2015

VIA E-MAIL

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Re: *United States v. Elijah Cooper*
Case No. CR 13-0693 SI

Dear Mr. Balogh:

In accordance with the Court's Final Pretrial Scheduling Order issued on April 23, 2015 and Federal Rule of Criminal Procedure 16(a)(1)(G), here is a summary of the expected testimony of the opinions, and bases and reasons for those opinions, of cell site expert Special Agent ("SA") Hector Luna. This letter supplements the notice provided on April 7, 2015.

The government expects that SA Luna will testify that it is possible to approximate to a fair degree of accuracy the location of a cellular telephone based on information contained in call detail records, based on the cell site location accessed for a particular call, along with any attendant cell sector information. SA Luna will testify that, on February 5, 2015, signals from the cellular phone assigned to call number 415-410-9786 were received by cell towers in the Bay Area.

The government expects that SA Luna will testify about the methods of cellular telephone communications and how those communications are made possible by sending signals to nearby cell site towers. SA Luna will explain that cellular telephone networks provide service to their customers through antennas deployed across the provider's coverage area. When the user places an outbound call, the handset transmits that communication over the airwaves to a nearby tower antenna, which relays the call to a local switch for routing. Conversely, whenever another party places a call to a user's cellular telephone, the network "pages" that phone to alert the owner to the incoming call; if the owner answers, the call are put through and (as before) carried by a tower near the phone. As a result, the system's awareness of a wireless phone's general whereabouts is essential

to providing cellular service. Spacing between antenna towers varies depending on a number of factors, especially terrain and population density. Except in sparsely populated areas, a typical tower will have three separate antenna faces (also called sectors), with each face serving a 120-degree portion of the roughly circular coverage area extending out from the antenna mast.

Whenever a cellular phone user initiates or receives a communication—such as a voice call or text message—the carrier routinely creates a record, including the date and exact time, of the tower and sector handling the communication at the start and end of the communication. From the data collected by service providers, it is possible to determine the general geographic location area of a cell phone at a specific time.

Based on this information, and utilizing cell tower information for MetroPCS cell towers as of September 20, 2012, and the information in Metro PCS call detail records for 415-410-9786, the government expects SA Luna will testify that, on February 5, 2013:

- At 12:06:13, a call was made from 415-913-8465 to 415-410-9786, which lasted 5 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:06:22, a call was made from 415-410-9786 to 415-913-8465, which lasted 9 minutes, 34 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:16:13, a call was made from 415-410-9786 to 415-583-1323, which lasted 36 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:16:59, a call was made from 415-756-9353 to 415-410-9786, which lasted 20 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:18:43, a call was made from 415-583-1323 to 415-410-9786, which lasted 37 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:27:32, a call was made from 415-756-9353 to 415-410-9786, which lasted 16 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:27:48, a call was made from 415-756-9353 to 415-410-9786, which lasted 2 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1;

Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.

- At 12:27:56, a call was made from 415-756-9353 to 415-410-9786, which lasted 15 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:28:25, a call was made from 415-410-9786 to 415-583-1323, which lasted 1 minute, 28 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:30:00, a call was made from 415-410-9786 to 415-756-9353, which lasted 35 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 12:36:49, a call was made from 415-583-1323 to 415-410-9786, which lasted 18 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 13:00:14, a call was made from 415-913-8465 to 415-410-9786, which lasted 2 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 13:25:01, a call was made from 415-410-9786 to 415-728-8085, which lasted 26 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 13:25:34, a call was made from 415-410-9786 to 415-583-1323, which lasted 21 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 13:26:08, a call was made from 415-913-8465 to 415-410-9786, which lasted 33 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 13:32:32, a call was made from 415-913-8465 to 415-410-9786, which lasted 16 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector

- 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 13:59:20, a call was made from 415-374-3867 to 415-410-9786, which lasted 27 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 46, which is located at 37.7403 latitude, -122.393 longitude; and sector 2, the center of which is orientated at 150 degrees from due north, and generally covers 90 degrees to 210 degrees from due north.
 - At 14:02:25, a call was made from 415-240-0486 to 415-410-9786, which lasted 4 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 46, which is located at 37.7403 latitude, -122.393 longitude; and sector 2, the center of which is orientated at 150 degrees from due north, and generally covers 90 degrees to 210 degrees from due north.
 - At 14:03:27, a call was made from 415-410-9786 to 415-240-0486, which lasted 27 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 46, which is located at 37.7403 latitude, -122.393 longitude; and sector 2, the center of which is orientated at 150 degrees from due north, and generally covers 90 degrees to 210 degrees from due north.
 - At 14:06:36, a call was made from 415-410-9786 to 415-913-8465, which lasted 37 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
 - At 14:14:39, a call was made from 415-374-3867 to 415-410-9786, which lasted 35 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
 - At 14:30:34, a call was made from 415-410-9786 to 415-240-0486, which lasted 44 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 438, which is located at 37.732006 latitude, -122.375317 longitude; and sector 2,¹ the center of which is orientated at 230 degrees from due north, and generally covers 170 degrees to 290 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
 - At 14:48, a call was made from 415-410-9786 to 415-368-1384, which lasted 39 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 438, which is located at 37.732006 latitude, -122.375317 longitude; and sector 3,² the center of which is orientated at 310 degrees from due north, and generally covers 250 degrees to 10 degrees from due north.
 - At 15:38:45, a call was made from 415-728-8085 to 415-410-9786, which lasted 4 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 438, which is located at 37.732006 latitude, -122.375317 longitude; and sector 2, the

¹ At some point between October 24, 2012 and March 5, 2013, the cell tower at Switch San Francisco #1, Tower 438, and sector 2 decreased in beam width, which decreased the size range of the sector.

² At some point between October 24, 2012 and March 5, 2013, the cell tower at Switch San Francisco #1, Tower 438, and sector 3 decreased in beam width, which decreased the size range of the sector.

center of which is orientated at 230 degrees from due north, and generally covers 170 degrees to 290 degrees from due north.

- At 15:39:58, a call was made from 415-410-9786 to 415-728-8085, which lasted 4 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 47, which is located at 37.76 latitude, -122.388 longitude; and sector 2, the center of which is orientated at 180 degrees from due north, and generally covers 120 degrees to 240 degrees from due north.
- At 15:40:10, a call was made from 415-410-9786 to 415-240-0486, which lasted 19 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 15:40:32, a call was made from 415-410-9786 to 415-240-0486, which lasted 17 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 438, which is located at 37.732006 latitude, -122.375317 longitude; and sector 3, the center of which is orientated at 310 degrees from due north, and generally covers 250 degrees to 10 degrees from due north.
- At 15:42:48, a call was made from 415-410-9786 to 415-583-1323, which lasted 35 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 438, which is located at 37.732006 latitude, -122.375317 longitude; and sector 3, the center of which is orientated at 310 degrees from due north, and generally covers 250 degrees to 10 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 15:44:12, a call was made from 415-410-9786 to 415-368-1384, which lasted 15 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 438, which is located at 37.732006 latitude, -122.375317 longitude; and sector 3, the center of which is orientated at 310 degrees from due north, and generally covers 250 degrees to 10 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 15:57:15, a call was made from 415-410-9786 to 415-728-8085, which lasted 50 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 16:10:37, a call was made from 415-728-8085 to 415-410-9786, which lasted 48 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 443, which is located at 37.749047 latitude, -122.417939 longitude; and sector 1,³ the center of which is orientated at 150 degrees from due north, and generally covers 90 degrees to 210 degrees from due north.
- At 16:26:05, a call was made from 415-913-8465 to 415-410-9786, which lasted 8 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San

³ At some point between October 24, 2012 and March 5, 2013, the cell tower at Switch San Francisco #1, Tower 443, and sector 1 increased in beam width, which increased the size range of the sector.

San Francisco #1; Tower 47, which is located at 37.76 latitude, -122.388 longitude; and sector 2, the center of which is orientated at 180 degrees from due north, and generally covers 120 degrees to 240 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 2, the center of which is orientated at 280 degrees from due north, and generally covers 220 degrees to 340 degrees from due north.

- At 16:28:07, a call was made from 415-913-8465 to 415-410-9786, which lasted 35 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 46, which is located at 37.7403 latitude, -122.393 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 2, the center of which is orientated at 280 degrees from due north, and generally covers 220 degrees to 340 degrees from due north.
- At 16:52:55, a call was made from 415-913-8465 to 415-410-9786, which lasted 42 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 53, which is located at 37.6736 latitude, -122.389 longitude; and sector 3,⁴ the center of which is orientated at 340 degrees from due north, and generally covers 280 degrees to 40 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1,⁵ the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.
- At 16:53:55, a call was made from 415-410-9786 to 415-728-8085, which lasted 50 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.
- At 16:55:09, a call was made from 415-504-4856 to 415-410-9786, which lasted 45 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.
- At 16:56:56, a call was made from 415-410-9786 to 415-728-8085, which lasted 27 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 53, which is located at 37.6736 latitude, -122.389 longitude; and sector 3, the center of which is orientated at 340 degrees from due north, and generally covers 280 degrees to 40 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.
- At 16:57:31, a call was made from 415-410-9786 to 415-499-2435, which lasted 16 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San

⁴ At some point between October 24, 2012 and March 5, 2013, the cell tower at Switch San Francisco #1, Tower 53, and sector 3 decreased in beam width, which decreased the size range of the sector.

⁵ At some point between October 24, 2012 and March 5, 2013, the cell tower at Switch San Francisco #1, Tower 588, and sector 1 decreased in beam width, which decreased the size range of the sector.

Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.

- At 16:57:50, a call was made from 415-410-9786 to 415-499-2435, which lasted 4 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #2; Tower 106, which is located at 37.7631 latitude, -122.2535 longitude; and sector 3, the center of which is orientated at 270 degrees from due north, and generally covers 210 degrees to 330 degrees from due north.
- At 16:58:11, a call was made from 415-499-2435 to 415-410-9786, which lasted 43 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.
- At 17:02:10, a call was made from 415-913-8465 to 415-410-9786, which lasted 24 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 588, which is located at 37.716444 latitude, -122.382778 longitude; and sector 1, the center of which is orientated at 30 degrees from due north, and generally covers 330 degrees to 90 degrees from due north.
- At 17:06:13, a call was made from 415-240-0486 to 415-410-9786, which lasted 2 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 17:13:10, a call was made from 415-410-9786 to 415-913-8465, which lasted 28 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 47, which is located at 37.76 latitude, -122.388 longitude; and sector 2, the center of which is orientated at 180 degrees from due north, and generally covers 120 degrees to 240 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 9, which is located at 37.7421 latitude, -122.379 longitude; and sector 1, the center of which is orientated at 160 degrees from due north, and generally covers 100 degrees to 220 degrees from due north.
- At 17:27:33, a call was made from 415-728-8085 to 415-410-9786, which lasted 10 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 47, which is located at 37.76 latitude, -122.388 longitude; and sector 2, the center of which is orientated at 180 degrees from due north, and generally covers 120 degrees to 240 degrees from due north.
- At 17:28:30, a call was made from 415-728-8085 to 415-410-9786, which lasted 2 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 47, which is located at 37.76 latitude, -122.388 longitude; and sector 2, the center of which is orientated at 180 degrees from due north, and generally covers 120 degrees to 240 degrees from due north.
- At 17:29:07, a call was made from 415-410-9786 to 415-728-8085, which lasted 30 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 47, which is located at 37.76 latitude, -122.388 longitude; and sector 2, the center of which is orientated at 180 degrees from due north, and generally covers 120 degrees to 240 degrees from due north.

- At 17:47:46, a call was made from 415-410-9786 to 415-728-8085, which lasted 35 seconds. At the beginning of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 39, which is located at 37.7808 latitude, -122.408 longitude; and sector 3, the center of which is orientated at 275 degrees from due north, and generally covers 215 degrees to 335 degrees from due north. At the end of this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 39, which is located at 37.7808 latitude, -122.408 longitude; and sector 1, the center of which is orientated at 15 degrees from due north, and generally covers 315 degrees to 75 degrees from due north.
- At 17:54:12, a call was made from 415-913-9423 to 415-410-9786, which lasted 6 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 39, which is located at 37.7808 latitude, -122.408 longitude; and sector 1, the center of which is orientated at 15 degrees from due north, and generally covers 315 degrees to 75 degrees from due north.
- At 17:54:26, a call was made from 415-913-9423 to 415-410-9786, which lasted 11 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 39, which is located at 37.7808 latitude, -122.408 longitude; and sector 1, the center of which is orientated at 15 degrees from due north, and generally covers 315 degrees to 75 degrees from due north.
- At 17:58:46, a call was made from 415-410-9786 to 415-913-9423, which lasted 35 seconds. Throughout this call, the cell tower utilized by 415-410-9786 was Switch San Francisco #1; Tower 39, which is located at 37.7808 latitude, -122.408 longitude; and sector 2, the center of which is orientated at 155 degrees from due north, and generally covers 95 degrees to 215 degrees from due north.

Using the latitude, longitude, and sector information above, SA Luna will plot on a map these cell towers utilized by the cell phone 415-410-9786. The map will not be completed until May 1, 2015, but the information above provides a summary of the expected testimony of SA Luna's opinions, and bases and reasons for those opinions, as to the location and orientation of each cell tower that was utilized for each specific call made by or to 415-410-9786 on February 5, 2015 between 12:06:13 and 17:58:46. The government no longer offers SA Luna as an expert to testify to cell site location information for other calls or other cell phones.

Please contact me if you have any questions concerning the foregoing.

Very truly yours,

MELINDA HAAG
United States Attorney

/s/

MARC PRICE WOLF
BRIGID MARTIN
Assistant United States Attorneys

EXHIBIT B

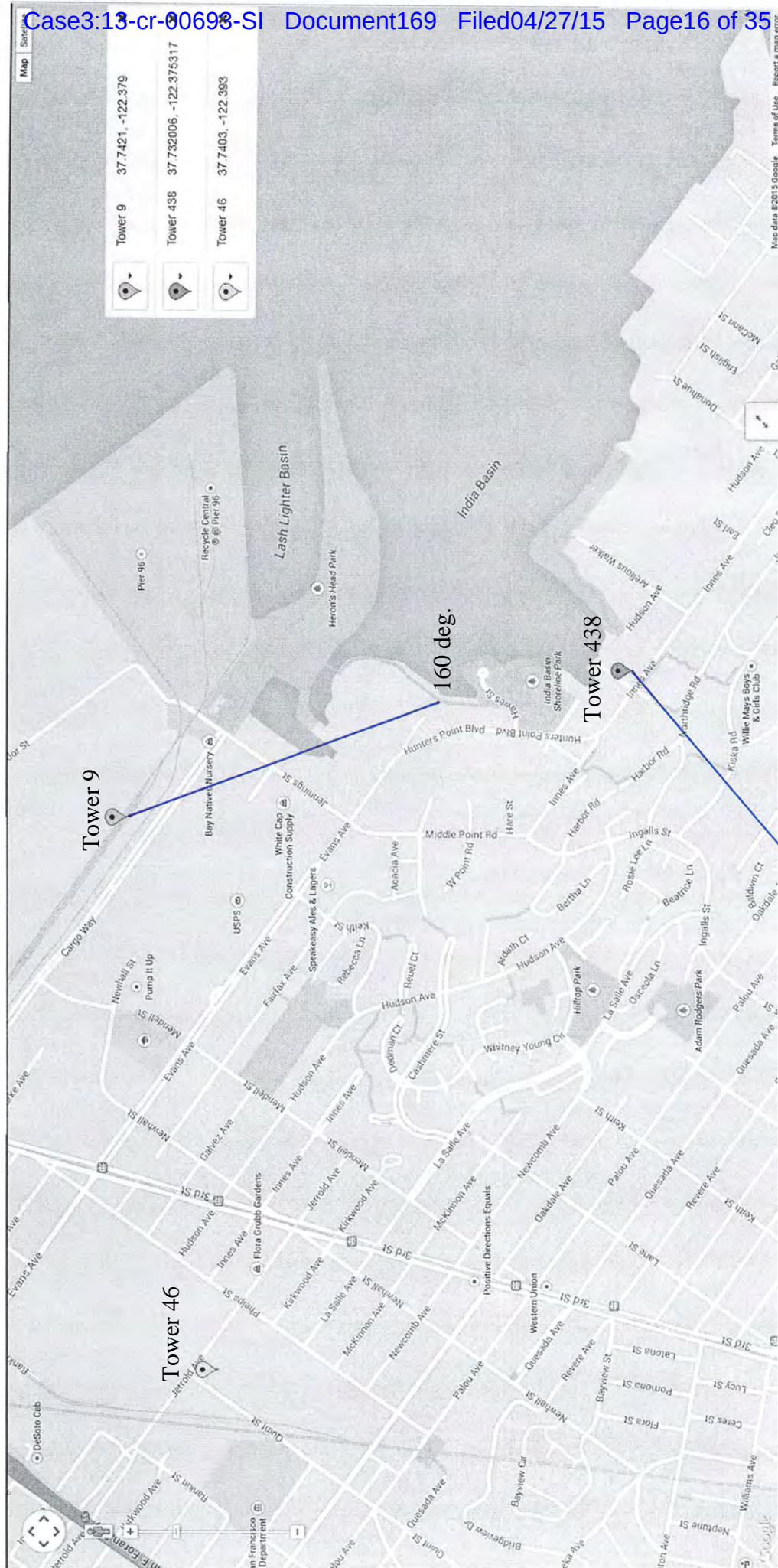


EXHIBIT C

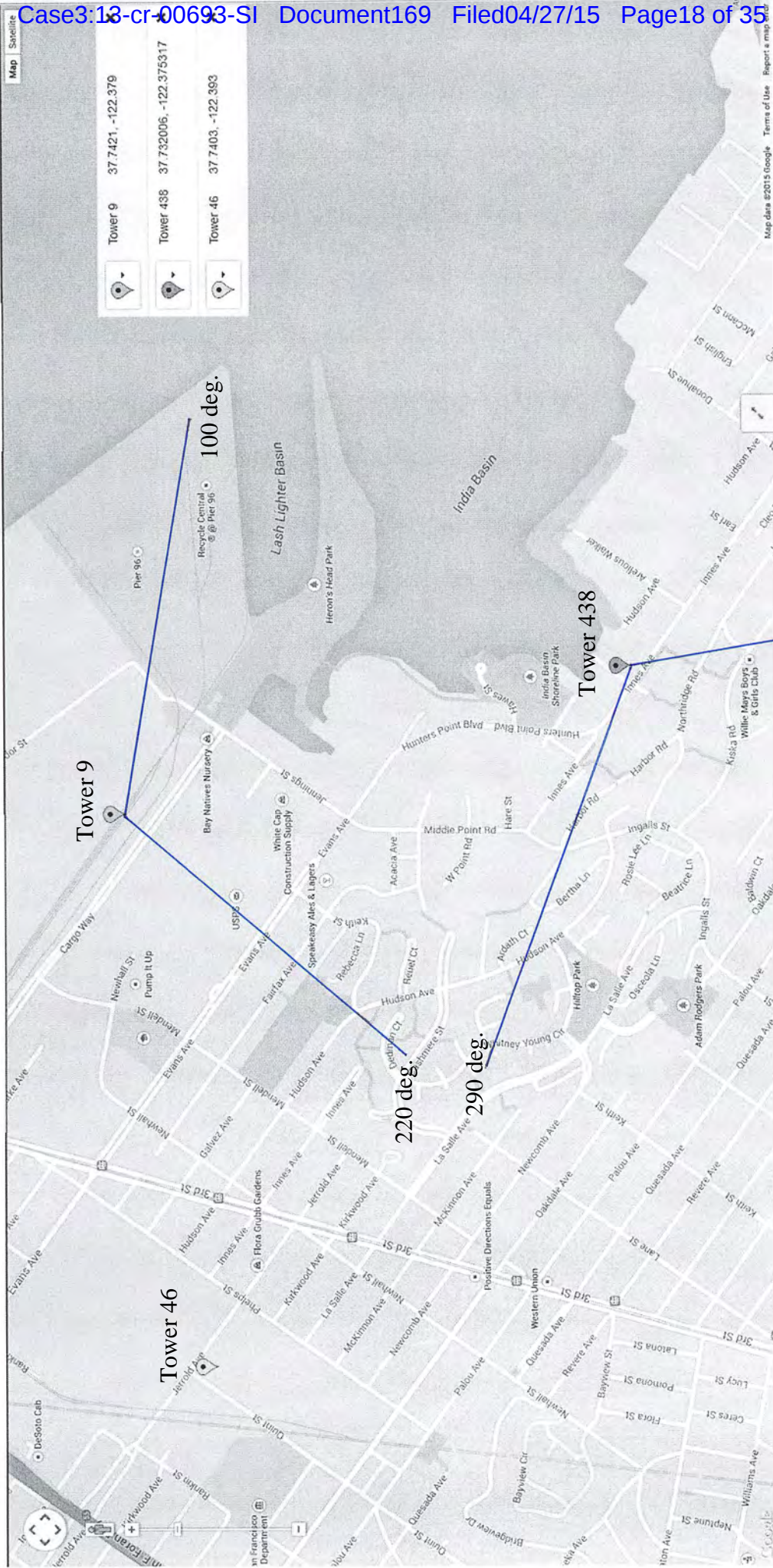


EXHIBIT D



EXHIBIT E

**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

UNITED STATES OF AMERICA

vs.

ANTONIO EVANS

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**Case No. 10 CR 747-3
Judge Joan H. Lefkow**

OPINION AND ORDER

This matter is before the court on the government’s motion *in limine* to admit cell site evidence and analysis through the testimony of Special Agent Joseph Raschke. (Dkt. #97.) On August 17, 2011, defendant Antonio Evans and two co-defendants were charged with conspiracy to kidnap in violation of 18 U.S.C. § 1201(c) (Count I) and kidnapping in violation of 18 U.S.C. § 1201(a)(1) (Count II).¹ (Dkt. #41.) The kidnapping allegedly took place on April 23 and 24, 2010. The government proposes to call Special Agent Raschke to testify about the operation of cellular networks and how to use historical cell site data to determine the general location of a cell phone at the time of a particular call. Applying a theory called “granulization,” Special Agent Raschke proposes to testify that calls placed from Evans’s cell phone during the course of the conspiracy could have come from the building where the victim was held for ransom.

On August 21 and 23, 2012, this court held an evidentiary hearing pursuant to Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), to determine whether the government’s proposed evidence

¹ The two co-defendants, Jerry Zambrano and Jose Antonio Lopez, pleaded guilty on April 27, 2012 and August 7, 2012 respectively. (See Dkt. #95, #115.)

and analysis are admissible. After the hearing, Evans moved for disclosure of expert evidence under Federal Rule of Criminal Procedure 16. (Dkt. #122.) For the reasons set forth herein, the government's motion *in limine* (dkt. #97) will be granted in part and denied in part and Evans's motion (dkt. #122) will be denied as moot.

LEGAL STANDARD

The admission of lay witness testimony is governed by Federal Rule of Evidence 701, which limits lay opinion testimony to that which is (1) rationally based on the witness's perception; (2) helpful to clearly understanding the witness's testimony or to determining a fact in issue; and (3) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702. Fed. R. Evid. 701. The admission of expert opinion testimony is governed by Federal Rule of Evidence 702 and *Daubert*. See *Bielskis v. Louisville Ladder, Inc.*, 663 F.3d 887, 893 (7th Cir. 2011). Rule 702 states that a witness who is qualified as an expert by knowledge, skill experience, training or education may testify in the form of opinion or otherwise provided that "(1) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (2) the testimony is based on sufficient facts or data; (3) the testimony is the product of reliable principles and methods; and (4) the expert has reliably applied the principles and methods to the facts of the case." Fed. R. Evid. 702. To admit expert testimony under this rule, the court must determine that (1) the witness is qualified; (2) the expert's methodology is scientifically reliable; and (3) the testimony will assist the trier of fact to understand the evidence or to determine a fact in issue. *Myers v. Ill. Cent. R.R. Co.*, 629 F.3d 639, 644 (7th Cir. 2010).

In *Daubert* the United States Supreme Court set out four factors the court may consider when assessing the reliability of an expert's methodology, including (1) whether the theory is based on scientific or other specialized knowledge that has been or can be tested; (2) whether the theory has been subjected to peer review; (3) the known or potential rate of error and the existence of standards controlling the theory's operation; and (4) the extent to which the theory is generally accepted in the relevant community. *Daubert*, 509 U.S. at 593–94; *see also Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 151, 119 S. Ct. 1167, 143 L. Ed. 2d 238 (1999).

The Rule 702 inquiry “is a flexible one.” *Daubert*, 509 U.S. at 594. As such, “[d]eterminations on admissibility should not supplant the adversarial process; ‘shaky’ expert testimony may be admissible, assailable by its opponents through cross-examination.” *Gayton v. McCoy*, 593 F.3d 610, 616 (7th Cir. 2010). The proponent of the testimony bears the burden of proving that the proffered testimony meets these requirements, and the Seventh Circuit grants the district court “wide latitude in performing its gate-keeping function.” *Bielskis*, 663 F.3d at 894 (internal quotation marks and citation omitted).

BACKGROUND

The government has obtained what it alleges are the call data records for the phone registered to Evans during the time of the alleged conspiracy. The data contained in these records includes the date and time of calls originating from Evans's phone, the duration of each call, and the originating and terminating cell tower (also known as cell site) used by the phone to place the call. Using these records, Special Agent Raschke testified that he could apply the granulation theory to estimate the general location of Evans's phone during the time calls were

placed. To understand the theory of granulization it is necessary to understand how a cellular network operates.

According to Special Agent Raschke, when a cell phone is in idle mode, it regularly communicates with cell towers in its network. Using radio frequency waves, the phone tries to determine which cell tower has the strongest signal. In urban areas, cell towers are often located on top of buildings or water towers. A cell tower emits radio frequency waves in all directions, providing cell phone coverage in a 360 degree radius around the tower. Three antennas typically comprise each tower; each antenna covers a 120 degree area. When a cell phone places a call, it typically connects to the tower in its network with the strongest signal. This is usually the tower nearest to the phone, although a variety of factors including physical obstructions and topography can determine which tower services a particular phone. Once the call reaches the tower, this interaction is recorded by the network provider. The call then proceeds to a mobile switching center, which may choose to reroute the call to a different tower based on network traffic. The call may also be rerouted to a different tower if the caller changes location during the duration of the call. These data are recorded by the network and maintained as call data records.

To determine the location of a cell phone using the theory of granulization, Special Agent Raschke first identifies (1) the physical location of the cell sites used by the phone during the relevant time period; (2) the specific antenna used at each cell site; and (3) the direction of the antenna's coverage. He then estimates the range of each antenna's coverage based on the proximity of the tower to other towers in the area. This is the area in which the cell phone could connect with the tower given the angle of the antenna and the strength of its signal. Finally,

using his training and experience, Special Agent Raschke predicts where the coverage area of one tower will overlap with the coverage area of another.

Applying this methodology, Special Agent Raschke testified that he could estimate the general location of Evans's cell phone during an 18 minute period (from 12:54 p.m. to 1:12 p.m.) on April 24, 2010, during which time Evans's phone used two cell towers to place nine calls. According to Special Agent Raschke, based on his estimate of the coverage area for each of the antennas, the calls made from Evans's phone could have come from the location where the victim was held for ransom. In support, the government proposes to admit summary exhibit 6, which is a map of the two towers used by Evans's phone and a drawing of the estimated coverage overlap of the two towers. The building where the victim was held falls squarely within the coverage overlap of the two towers. (*See* Gov't Summ. Ex. 6.) In addition to this exhibit, the government also proposes to introduce maps indicating the location of cell towers used by Evans's phone in relation to other locations relevant to the crime (Gov't Summ. Exs. 1–5),² maps showing the topography of the area between the two towers indicated in summary exhibit 6 (Gov't Summ. Ex. 7–8), and a listing of the total number of calls placed by Evans's phone during the relevant time period that originated or terminated with one of the two towers (Gov't Summ. Ex. 9).³

² Government summary exhibit 1 also contains a line from the location of one of the cell towers used by Evans's phone to the location where the victim was kidnapped, demonstrating the close proximity of the two locations.

³ The government has also moved to admit the call data records under the business record exception to the hearsay rule. *See* Fed. R. Evid. 803(6). Assuming the proper foundation is laid, these records are likely admissible. *See United States v. Graham*, 846 F. Supp. 2d. 384, 389 (D. Md. 2012) (stating that historical cell site location records are “created by cellular providers in the ordinary course of business”).

ANALYSIS

I. Admissibility of maps containing cell tower locations and other locations relevant to the crime

As an initial matter, the government argues that a portion of Special Agent Raschke's testimony is admissible under Rule 701, specifically, his testimony concerning maps he created indicating the location of certain cell towers used by Evans's phone during the course of the conspiracy in relation to other locations relevant to the crime. (*See* Gov't Summ. Exs. 1–5.) The court agrees that using Google Maps to plot these locations does not require scientific, technical, or other specialized knowledge and that these exhibits are admissible through lay opinion testimony under Rule 701.

The relevancy of these exhibits, however, is primarily based on the premise that a cell phone connects to the tower in its network with the strongest signal, and the tower with the strongest signal is usually the one closest to the cell phone at the time the call is placed. Although this is the general rule, there are a variety of factors that determine the tower to which a cell phone will connect. *See* Aaron Blank, *The Limitations and Admissibility of Using Historical Cellular Site Data to Track the Location of a Cellular Phone*, 18 RICH. J. L. & TECH. 3, at *7 (Fall 2011) (identifying factors that affect a tower's signal strength to include the technical characteristics of the tower, antennas and phone, environmental and geographical features and indoor or outdoor usage); Matthew Tart et al., *Historic cell site analysis - Overview of principles and survey methodologies*, 8 DIGITAL INVESTIGATION 1, 186 (2012) (“In a perfectly flat world with equally spaced and identical masts, a mobile phone user would generally connect to the closest mast. In the real world, however, this is not necessarily the case.”). Indeed,

Special Agent Raschke himself testified that topography, physical obstructions and the signal strength of other towers can impact whether a cell phone connects to the tower closest to it.

Lay witness testimony is admissible under Rule 701 when it is “rationally based on [a] witness’s perception” or based on “a process of reasoning familiar in everyday life.” Fed. R. Evid. 701 & advisory comm. notes (2000 amends.); *see also United States v. Conn*, 297 F.3d 548, 554 (7th Cir. 2002) (“Lay opinion testimony is admissible only to help the jury or the court to understand the facts about which the witness is testifying and not to provide specialized explanations or interpretations that an untrained layman could not make if perceiving the same acts or events.” (quoting *United States v. Peoples*, 250 F.3d 630, 641 (8th Cir. 2001))).

Understanding how the aforementioned factors affect a cell phone’s ability to connect a particular tower, however, cannot be said to be within the perception of the untrained layman. Rather, this type of understanding demands “scientific, technical, or other specialized knowledge” of cellular networks and “results from a process of reasoning which can be mastered only by specialists in the field.” Fed. R. Evid. 701 & advisory comm. notes (2000 amends.); *Conn*, 297 F.3d at 554 (“Expert opinion . . . brings to an appraisal of those facts . . . that the lay person cannot be expected to possess.”)⁴ Special Agent Raschke may therefore provide lay

⁴ As recently explained by the Seventh Circuit,

[a] law-enforcement officer’s testimony is a lay opinion if it is limited to what he observed . . . or to other facts derived exclusively from [a] particular investigation. On the other hand, an officer testifies as an expert when he brings the wealth of his experience as [an] officer to bear on those observations and ma[kes] connections for the jury based on that specialized knowledge.

United States v. Christian, 673 F.3d 702, 709 (7th Cir. 2012) (internal quotation marks and citations omitted); *see Compania Administradora de Recuperacion de Activos Administradora de Fondos de Inversion Sociedad Anonima v. Titan Int’l, Inc.*, 533 F.3d 555, 561 (7th Cir. 2008) (“Testimony based
(continued...)”)

opinion testimony concerning (1) the call data records obtained for Evans's phone and (2) the location of cell towers used by Evans's phone in relation to other locations relevant to the crime; but if he wishes to testify concerning (1) how cellular networks operate, *i.e.*, the process by which a cell phone connects to a given tower or (2) granulization theory he must first meet the demands of Rule 702 and *Daubert*.⁵

II. Admissibility of testimony concerning how cellular networks operate and the theory of granulization under Rule 702 and *Daubert*

A. Whether Special Agent Raschke is qualified to testify as an expert

Special Agent Raschke testified that he has been a member of the Federal Bureau of Investigation for 14 years and currently serves on the agency's Violent Crimes and Fugitive Task Force. He has received over 350 hours of training and instruction in the use of cellular phones and investigations and spends approximately 70 percent of his time in his current position analyzing cell phone records. He has instructed approximately 700 officers in basic techniques for utilizing cell phones in investigations and has been qualified as an expert in the use of historical cell site data in five state court cases in the past two years. (*See* Gov't Ex. CV.)

(...continued)

solely on a person's special training or experience is properly classified as expert testimony, and therefore it is not admissible under Rule 701.”)

⁵ On this point, the court respectfully disagrees with those courts that have allowed law enforcement officers to provide lay opinion testimony as to how cellular networks operate or the use of call data records to determine the location of a cell phone. *See, e.g., United States v. Feliciano*, 300 F. App'x. 795, 801 (11th Cir. 2008) (allowing officer to provide lay opinion testimony based on his “particularized knowledge garnered from years of experience in the field,” but relying on *Tampa Bay Shipbuilding & Repair Co. v. Cedar Shipping Co.*, 320 F.3d 1213, 1223 (11th Cir. 2003) for a position that has been called into doubt in this district, *see Chen v. Mayflower Transit, Inc.*, 224 F.R.D. 415, 419 (N.D. Ill. 2004)); *United States v. Henderson*, No. CR 10-117 BDB, 2011 WL 6016477, at *4–5 (N.D. Okla. Dec. 2, 2011) (allowing agent to provide lay opinion testimony that cell phone records “identif[y] the cell tower that was nearest to the location of the cell phone at the time a particular call was made or received”).

Special Agent Raschke testified that he has received training from Sprint-Nextel on how their cellular network operates and is familiar with the operation of this and similar networks. He also stated that he has successfully used historical cell site data on a number of occasions to locate people (both dead and alive) in the course of other FBI investigations.

Based on this testimony, the court is satisfied that Special Agent Raschke is qualified to testify as an expert concerning the operation of cellular networks and granulization theory. *See United States v. Allums*, No. 2:08–CR–30 TS, 2009 WL 806748, at **2–3 (D. Utah Mar. 24, 2009) (holding that FBI agent was qualified to provide expert testimony on historical cell site analysis where he underwent two official FBI training courses on how cell technology and cell networks function, five training courses on radio frequency theory, and was obtaining a master’s degree in geospatial technology); *see also United States v. Schaffer*, 439 F. App’x. 344, 347 (5th Cir. 2011) (finding that lower court did not err in allowing FBI agent to provide expert testimony where agent taught courses on historical cell site analysis, his students had qualified as experts, and he had used the technique without error on at least 100 occasions).

B. Whether Special Agent Raschke’s testimony concerning how cellular networks operate is admissible under Rule 702

Rule 702 instructs that when a qualified expert provides testimony regarding general principles, without trying to apply those principles to the facts of the case, the expert’s testimony need only (1) address a subject matter on which the factfinder can be assisted by an expert; (2) be reliable; and (3) “fit” the facts of the case. Fed. R. Evid. 702 advisory comm. notes (2000 amends.). Here, testimony concerning how cellular networks operate would be helpful because it would allow the jury to narrow the possible locations of Evans’s phone during the course of the conspiracy. Although Special Agent Raschke is not an engineer and has never worked for a

network provider, he has received extensive training on how cellular networks operate and is in regular contact with network engineers. He also spends a majority of his time analyzing cell site records, which requires a thorough understanding of the networks themselves. The court concludes that his testimony on this subject is reliable. Finally, it is undisputed that a phone registered to Evans used certain cell towers to place a number of calls during the course of the conspiracy and, as such, Special Agent Raschke's testimony on this topic fits squarely within the facts of this case.⁶

C. Whether Special Agent Raschke's testimony concerning the theory of granulization is admissible under Rule 702

Special Agent Raschke testified that using a theory of granulization he can estimate the range of certain cell sites based on a tower's location to other towers. This in turn allows him to predict the coverage overlap of two closely positioned towers. Special Agent Raschke testified that he has used this theory numerous times in the field to locate individuals in other cases with a zero percent rate of error. He also testified that other agents have successfully used this same method without error. No evidence was offered, however, beyond Special Agent Raschke's

⁶ Evans's proposed expert, Manfred Schenk, contested Special Agent Raschke's opinion regarding which cell towers get recorded in the call data records. According to Schenk, the only cell tower that gets recorded is the tower that ultimately services the call (*i.e.*, the tower assigned by the mobile switching center, not the tower that the phone initially connects to before being routed to the mobile switching center.) This factual disagreement goes to the weight not the admissibility of Special Agent Raschke's testimony. *See, e.g., Traharne v. Wayne Scott Fetzer Co.*, 156 F. Supp. 2d 717, 723 (N.D. Ill. 2001) ("Factual inaccuracies are to be explored through cross-examination and go toward the weight and credibility of the evidence not admissibility." (citing *Walker v. Soo Line R.R. Co.*, 208 F.3d 581, 586–89 (7th Cir. 2000)). The same is true for the line connecting the location of the kidnapping to the cell tower used by Evans's phone on April 23, 2010 contained in summary exhibit 1. Evans is free to solicit on cross examination factors other than proximity that may have caused Evans's phone to connect with that particular tower.

to the granulization theory is reliable. As such, testimony concerning this theory, along with the estimated range of coverage for each of the towers indicated on summary exhibit 6, will be excluded under Rule 702 and *Daubert*. Because summary exhibits 7 through 9 do not contain estimated ranges of coverage, they will be admitted.

CONCLUSION AND ORDER

To summarize, the government's motion *in limine* to admit cell site evidence and analysis (dkt. #97) is granted in part and denied in part. Special Agent Raschke is qualified to provide expert testimony concerning how cellular networks operate. Based on this testimony, summary exhibits 1 through 5 and 7 through 9 are admissible at trial. Special Agent Raschke may not testify concerning the theory of granulization, which the court finds to be unreliable. In addition, the estimated coverage areas contained in summary exhibit 6 must be removed before the court will admit this exhibit. Evans's motion for disclosure of expert evidence under Rule 16 (dkt. #122) is denied as moot.

Dated: August 29, 2012

Enter: Joan H. Lefkow
JOAN HUMPHREY LEFKOW
United States District Judge

PROOF OF SERVICE

I, Ethan A. Balogh, certify that on April 27, 2015, I served all parties in this matter by causing the preceding pleading to be filed electronically, as set forth by Local Rule 5-1.

Dated: April 27, 2015 */s/ E A Balogh*
ETHAN A. BALOGH